

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Original) A lithography system comprising:

- means for generating a plurality of light beamlets;
- an electron source, arranged to be illuminated by said light beamlets, said electron source comprising a plurality of converter elements at an element distance from each other for converting a light beamlet impinging onto it into an electron beamlet directed towards and focused on an object plane, and
- control means for matching the mutual positions of the light beamlets with respect to the mutual positions of the electron beamlets.

2-23 (Canceled)

24. (New) The lithography system of claim 1, wherein the control means for manipulating the mutual positions of the light beamlets and the electron beamlets comprise converter adaptive means for actively adapting the distance between at least two electron beamlets of the converter.

25. (New) The lithography system of claim 24, wherein the converter adaptive means comprise means for adapting the physical properties of the converter.

26. (New) The lithography system of claim 25, said means for adapting the physical properties of the converter comprising means for changing the element distance between at least two elements.

27. (New) The lithography system of claim 26, wherein the means for changing the element distance comprise converter-related thermal means for changing the temperature of the converter.

28. (New) The lithography system of claim 27, wherein said converter-related thermal means are adapted to change the temperature of the converter.

29. (New) The lithography system of claim 28, wherein said converter-related thermal means are adapted to change the temperature of the converter either uniformly or according to a predetermined temperature profile.

30. (New) The lithography system of claim 26, wherein the means for changing the element distance comprise converter-related mechanical means for applying mechanical forces to the converter.

31. (New) The lithography system of claim 30, wherein said converter-related mechanical means comprise means for applying the forces either uniformly or according to a predetermined profile.

32. (New) The lithography system of claim 30, wherein the mechanical forces are selected from the group consisting of either pressure forces, tension forces, torsion forces, and a combination of any one of these three forces.

33. (New) The lithography system of claim 1, wherein said means for generating a plurality of light beamlets comprise:

- at least one light source for generating a light beam, and
- a micro lens array, arranged in the light path of said light source between said light source and said electron source, and comprising a plurality of lenses at a lens distance from each other, said plurality of lenses being arranged for forming said plurality of light beamlets, and for focussing said focusing said plurality of light beamlets onto said electron source.

34. (New) The lithography system of claim 33, wherein the said at least one light source is individually controllable.

35. (New) The lithography system of claim 33, wherein the control means comprise micro lens adaptive means for actively adapting the positions of focal points of at least one micro lens of the micro lens array.

36. (New) The lithography system of claim 35, wherein the micro lens adaptive means comprise means for adapting the physical properties of the micro lens array.

37. (New) The lithography system of claim 36, wherein the means for adapting the physical properties of the micro lens array comprises means for changing the lens distances.

38. (New) The lithography system of claim 37, wherein the means for changing the lens distance comprises microlens-related thermal means for changing the temperature of the micro lens array.

39. (New) The lithography system of claim 38, wherein the microlens-related thermal means are adapted to change the temperature of the micro lens array either uniformly or according to a predetermined temperature profile.

40. (New) The lithography system of claim 37, wherein the means for changing the lens distance comprises microlens-related mechanical means for applying mechanical forces to the micro lens array.

41. (New) The lithography system of claim 40, wherein said microlens-related mechanical means comprise means for applying the forces either uniformly or according to a predetermined profile.

42. (New) The lithography system of claim 40, wherein the mechanical forces are either pressure forces, tension forces, torsion forces or a combination of any one of these three forces.

43. (New) The lithography system of claim 37, wherein the control means comprise adaptive means for substantially matching said lens distance with said element distance by either expansion or contraction of at least one of said micro lens array and said electron source.

44. (New) The lithography system of claim 43, wherein said adaptive means comprise microlens-related thermal means for modifying said lens distance by either thermal expansion or contraction of said micro lens array.

45. (New) The lithography system of claim 44, wherein said microlens-related thermal means comprise microlens-related thermal elements, and a microlens-related thermal controller.

46. (New) The lithography system of claim 44, wherein said microlens-related thermal means are arranged to generate a microlens-related heat flow to or from said micro lens array.

47. (New) The lithography system of claim 46, wherein said microlens-related thermal means are arranged to control said microlens-related heat flow in dependence of a microlens-related control signal relating to the temperature of said micro lens array.

48. (New) The lithography system of claim 47, wherein said control signal is generated by a microlens-related temperature sensor for sensing the temperature.

49. (New) The lithography system of claim 47, wherein said control signal is related to a value of a detector signal generated by a microlens-related detector for indicating the match of said lens distance and said element distance.

50. (New) The lithography system of claim 33, wherein the control means comprise adaptive means for substantially matching said lens distance with said element distance by either expansion or contraction of at least one of said micro lens array and said electron source.

51. (New) The lithography system of claim 50, wherein said adaptive means comprise converter-related thermal means for modifying said element distance by either thermal expansion or contraction of said electron source.

52. (New) The lithography system of claim 51, wherein said converter-related thermal means comprise converter-related thermal elements and a converter-related thermal controller.

53. (New) The lithography system of claim 52, wherein said converter-related thermal elements are arranged to generate a converter-related heat flow to or from said electron source.

54. (New) The lithography system of claim 53, wherein the converter-related thermal controller is arranged to control said converter-related heat flow in dependence of a converter-related control signal relating to the temperature of said electron source.

55. (New) The lithography system of claims 54, wherein the converter-related control signal is generated by a converter-related temperature sensor for sensing the temperature.

56. (New) The lithography system of claim 55, wherein said control signal is related to a value of a detector signal generated by a converter-related detector for indicating the match of said lens distance and said element distance.

57. (New) The lithography system of claim 33, comprising first optical means for modifying the light from said at least one light source illuminating the micro lens array.

58. (New) The lithography system of claim 57, wherein said first optical means comprises a lens or system of lenses, for modifying the true or virtual focal point of the light from the light source.

59. (New) The lithography system of claim 57, wherein said first optical means comprise liquid crystal means for adaptively modifying the phase of the light from the light source.

60. (New) The lithography system of claim 59, wherein the modification of the phase is performed locally in a plane parallel to the micro lens array.

61. (New) The lithography system of claim 33, wherein the control means comprise adaptive means for substantially matching said lens distance with said element distance by either expansion or contraction of at least one of said micro lens array and said electron source.

62. (New) The lithography system of claim 61, wherein said adaptive means comprise mechanical means for applying mechanical forces to at least one of said micro lens array and said electron source for expanding or contracting of one of said micro lens array and said electron source.

63. (New) The lithography system of claim 33, wherein the control means comprise adaptive means for substantially matching said lens distance with said element distance by either expansion or contraction of at least one of said micro lens array and said electron source.

64. (New) The lithography system of claim 63, wherein said adaptive means comprise optical means.

65. (New) The lithography system of claim 64, wherein said optical means comprise phase shift gradient means.

66. (New) The lithography system of claim 64, wherein said phase shift gradient means comprise an LC-screen placed before or after the micro lens array.

67. (New) The lithography system of claim 64, wherein said optical means comprise a refractive lens before the micro lens array.

68. (New) The lithography system of claim 63, wherein said adaptive means further comprise means for displacing said refractive lens along the optical axis.

69. (New) The lithography system of claim 1, wherein said lithography system further comprises

- a mask comprising an image, and said light beamlet from each of said plurality of lenses is being focused on said mask
- an optical system being arranged for projecting said image on said electron source by said light beamlets of each of said plurality of lenses.

70. (New) The lithography system of claim 69, further comprising mask-holding means for holding a mask between the micro lens array and the electron source, wherein said control means comprise mask adaptive means for actively adapting the working parameters of the mask.

71. (New) The lithography system of claim 70, wherein the mask adaptive means comprise means for adapting the mutual distances of at least two features on the mask.

72. (New) The lithography system of claim 70, wherein the mask adaptive means comprise mask-related thermal means for changing the temperature of the mask, wherein said mask-related thermal means are adapted to change the temperature of the mask either uniformly or according to a predetermined temperature profile.

73. (New) The lithography system of claim 70, wherein the mask adaptive means comprise mask-related mechanical means for applying mechanical forces to the mask, wherein said mask-related mechanical means comprise means for applying the forces either uniformly or according to a predetermined profile and wherein the mechanical forces are either pressure forces, tension forces, torsion forces or a combination of any one of these three forces.

74. (New) The lithography system according to claim 1, wherein the control means comprise:

- measuring means for measuring the actual positions of at least one selected from the light beamlets and the electron beamlets;
- a comparator for comparing the actual positions of at least one selected from the light beamlets and the electron beamlets with desired positions;
- a processor for calculating a target setting of the positions, based on the comparisons of the comparator;
- a controlling element for adapting at least one of the working parameters of at least one of the micro lens array, the mask and the converter until the desired positions are reached.

75. (New) The lithography system according to claim 1, wherein the control means comprise magnetic means for actively adapting the positions of electron beamlets in the object plane.

76. (New) The lithography system of claim 75, wherein the magnetic means comprises at least one magnetic field generator for modifying the magnetic field between the electron source and the object plane.

77. (New) The lithography system of claim 76, said magnetic field generator applies a continuously varying magnetic field with a non-uniform magnetic field component.

78. (New) The lithography system of claim 77, wherein said magnetic field generator is adapted for creating a dipole or quadrupole field between the electron source and the object plane.

79. (New) The lithography system of claims 76, said magnetic field having a field strength that is increasing uniformly in at least one direction in a plane parallel to the object plane and furthermore increasing with the distance from the optical axis of the lithography system, especially when said magnetic field component is the radial component.

80. (New) A substrate processed using a lithography system comprising:

- means for generating a plurality of light beamlets;
- an electron source, arranged to be illuminated by said light beamlets, said electron source comprising a plurality of converter elements at an element distance from each other for converting a light beamlet impinging onto it into an electron beamlet directed towards and focused on an object plane, and
- control means for matching the mutual positions of the light beamlets with respect to the mutual positions of the electron beamlets.

81. (New) A method for processing a substrate, using a lithography system comprising:

- means for generating a plurality of light beamlets;
- an electron source, arranged to be illuminated by said light beamlets, said electron source comprising a plurality of converter elements at an element distance from each other for converting a light beamlet impinging onto it into an electron beamlet directed towards and focused on an object plane, and
- control means for matching the mutual positions of the light beamlets with respect to the mutual positions of the electron beamlets.